NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

MIL-PRF-39016/44D
20 JULY 1988
SUPERSEDING
MIL-R-39016/44C(EC)
13 August 1985

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, DPDT, LOW LEVEL TO 2 AMPERES, TERMINALS 0.200-INCH GRID PATTERN (SENSITIVE, 100/125 MILLIWATTS, COIL OPERATE POWER AT 25°C)

(D) This specification is approved for use by all Departments and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist of this specification and the latest issue of MIL-R-39016.

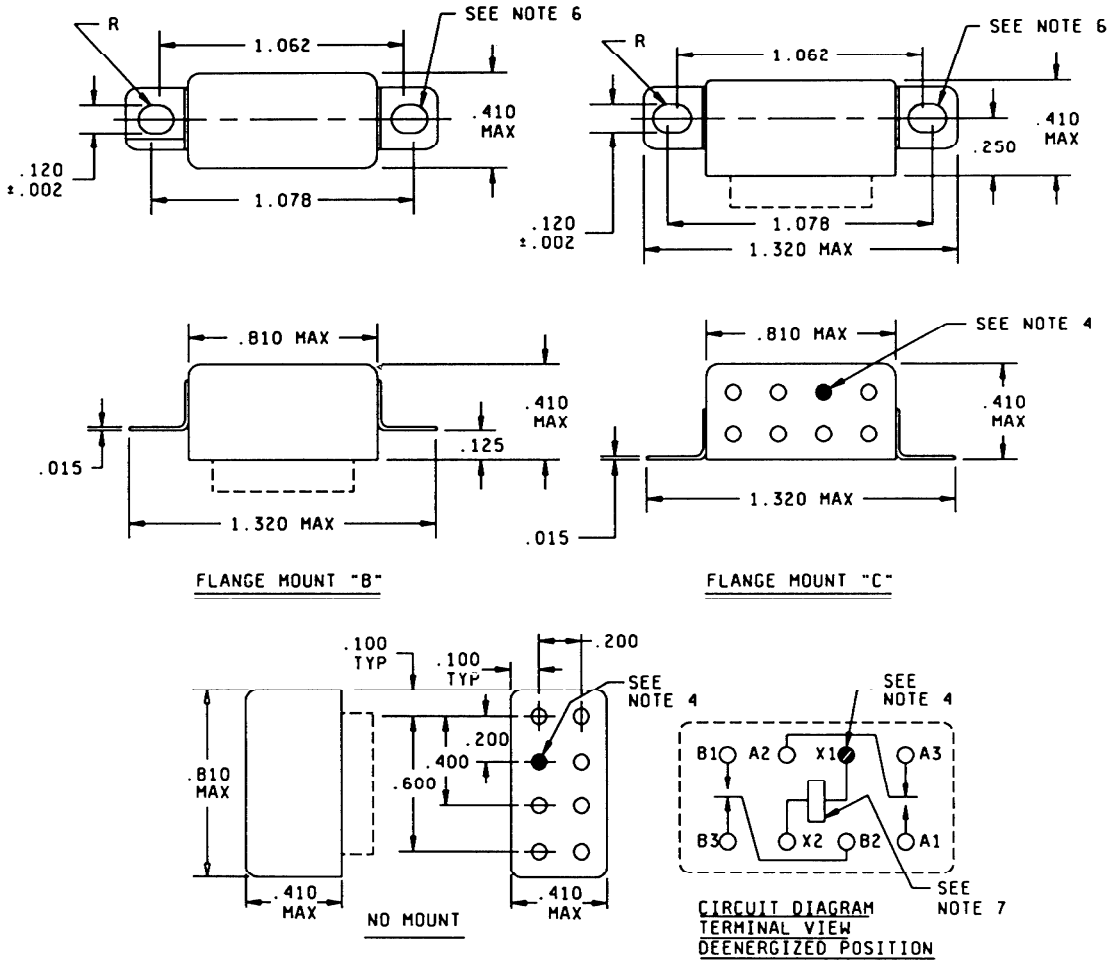
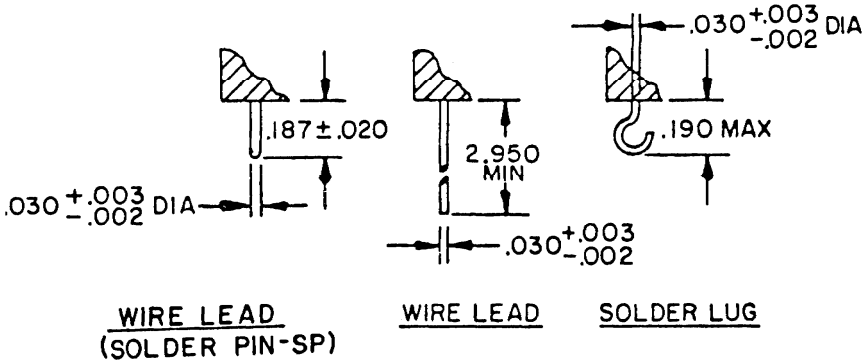


FIGURE 1. Dimensions and configuration.

(D) denotes changes



Inches	mm
.002	0.05
.003	0.08
.015	0.38
.020	0.51
.030	0.76
.100	2.54
.120	3.05
.125	3.18
.187	4.75
.190	4.83
.200	5.08
.250	6.35
.400	10.16
.410	10.41
.600	15.24
.810	20.57
1.062	26.97
1.078	27.38
1.320	33.53
2.950	74.93

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specifed, tolerance is ±.010 (0.25 mm).
(D) 4. Indicated terminal shall be marked with a contrasting bead.
5. Circuit diagram marked on top if legible from the mounted position, otherwise marking surface is optional.
6. Mounting screw head clearances based on use of No. 4 fillister head screws.
7. Coil symbols are optional per MIL-STD-1285.
8. Mounting surface finish shall be compatible with aluminum (duralumin type) as defined by the compatible couples table of MIL-R-39016.
(D) 9. Terminal numbers in circuit diagram are for reference only. Numbers do not appear on relay.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level (relay case grounded).

Resistive: 2 amperes at 28 V dc; 0.10 ampere maximum at 115 V ac, (60 and 400 Hz). For qualification testing, 400 Hz loads not required.

Inductive: 0.50 ampere maximum at 28 V dc maximum with 200 millihenries.

Lamp: 0.10 ampere at 28 V dc (life test not required).

Low level: 10 to 50 μA at 10 to 50 mV (dc or peak ac).

Intermediate current: Applicable.

Contact resistance or voltage drop:

(D) Initial: 0.050 ohm maximum.

High level:

During life: Not more than 5 percent of open circuit voltage.

(D) After life: 0.100 ohm maximum.

Low level:

During life: 33 ohms maximum.

(D) After life: 0.100 ohm maximum.

(D) Intermediate current:

During intermediate current: 1 ohm maximum.

(D) After intermediate current: 0.200 ohm maximum.

Contact bounce: 2 milliseconds (ms) maximum. (Applicable to failure rate level "L").

Contact stabilization time: 2.5 milliseconds (ms) maximum. (Applicable to failure rate levels "M", "P", and "R").

Overload (high level only): Two times rated current.

COIL DATA: (See table I).

Operate time: 6 milliseconds maximum over temperature range with rated coil voltage.

Release time: 5 milliseconds maximum over temperature range from rated coil voltage.

ELECTRICAL DATA:

Insulation resistance: 1,000 megohms minimum.

Dielectric withstanding voltage:

	Sea level V rms (60 Hz)	Altitude V rms (60 Hz)
Between case, frame, or enclosure, and between all contacts in the energized and deenergized positions	1,000	350 All terminals to case
Between case, frame, or enclosure and coil(s)	500	
Between all contacts and coil(s)	1,000	
Between open contacts in the energized and deenergized positions	500	
Between contact poles	1,000	

ENVIRONMENTAL DATA:

Temperature range: -65°C to +125°C.

Vibration (sinusoidal): MIL-STD-202, method 204, test condition D (except 10 to 2,500 Hz). Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

(D) Vibration (random): MIL-STD-202, method 214, test condition IG. Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts (applicable for qualification and group C testing only).

Shock (specified pulse): MIL-STD-202, method 213, test condition A (50 g). Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Magnetic interference: Applicable.

Resistance to soldering heat: Applicable.

Acceleration: Applicable.

PHYSICAL:

Dimensions and configurations: See figure 1.

Weight: 13 grams (0.46 ounce) maximum.

Terminals: See figure 1 and table I.

Terminal strength: 3 ±0.3 pounds pull.

(D) Solderability: Applicable.

Terminal twist test: Applicable to wire leads.

LIFE TEST REQUIREMENTS:

High level: 100,000 cycles.

(D) Low level: 100,000 cycles, plus 900,000 cycles mechanical life.

PART NUMBER: M39016/44-(dash number from table I and suffix letter designating failure rate level).

Ⓓ TABLE I. Dash number and characteristics. 1/

Dash number 2/			Mount	Coil voltage V dc 3/		At 25°C				Over temp range		
Solder lug	Wire lead (SP)	Wire lead		Rated	Max	Coil resistance ohms ±10%	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)
001 004 007	002 005 008	003 006 009	B C None	5.0	7.0	47	2.2 4/	1.32	0.21	3.2	1.9	0.12
010 013 016	011 014 017	012 015 018	B C None	6.0	9.0	75	2.75 4/	1.65	0.27	4.0	2.4	0.17
019 022 025	020 023 026	021 024 027	B C None	12.0	20.0	310	5.6 4/	3.35	0.55	8.0	4.8	0.35
028 031 034	029 032 035	030 033 036	B C None	26.5	35.0	1030	11.4 5/	6.9	1.1	16.5	10.0	0.70
046 049 052	047 050 053	048 051 054	B C None	30.0	44.0	1620	14.3 5/	8.6	1.4	21.0	12.5	0.90
037 040 043	038 041 044	039 042 045	B C None	36.0	56.0	2640	18.0 5/	10.9	1.8	26.0	15.8	1.10

1/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc or peak or open circuit are not recommended for subsequent use in low level applications.

2/ The suffix letter L, M, P, or R to designate the applicable failure rate level shall be added to the applicable listed dash number. Failure rate level (percent per 10,000 cycles): L, 3.0; M, 1.0; P, 0.1; R, 0.01. Example, 004L - - - 004R.

3/ CAUTION: The use of any coil voltage less than the rated coil voltage will voltage will compromise the operation of the relay.

4/ The sensitivity is 100 milliwatts.

5/ The sensitivity is 125 milliwatts.

QUALIFICATION INSPECTION:

Qualification inspection and sample size: See tables II and III.

Ⓓ TABLE II. Qualification inspection and sample size. 1/

Single submission	Group submission	
20 units plus 1 open unit for level L at C = 0 1/ 33 units plus 1 open unit for level M at C = 0 1/ Qualification inspection as applicable.	M39016/44-028	20 units plus 1 open unit for level L at C = 0 1/ 33 units plus 1 open unit for level M at C = 0 1/ Qualification inspection as applicable.
	M39016/44-033	2 units, qualification inspection table, group II, and shock, vibration, acceleration, terminal strength, and seal.
	M39016/44-008 -017 -026 -044	2 units, qualification inspection table, group II.

1/ The number of units required for qualification testing will be increased as required in group V, table II, MIL-R-39016, if relay manufacturer elects to test the number of units permitting one or more failures. Prior to performance of qualification inspection testing; the relay manufacturer shall preselect the sampling plan.

Ⓓ Qualification inspection (reduced testing): See table III.

If the relays produced for MIL-R-39016/44 are similar in construction and design, except for the coils, to the relays produced for MIL-R-39016/6, then reduced testing for qualification of MIL-R-39016/44 relays may be performed concurrent with or subsequent to successful qualification of MIL-R-39016/6 relays.

Ⓓ TABLE III. Qualification inspection (reduced testing).

Dash number	Examination or test
M39016/44-037	4 units, qualification inspection table, group II. 1 unit each, life load test, electrical post tests, seal, visual and mechanical examination.
M39016/44-032	2 units, qualification inspection table, group II, shock, vibration, acceleration, electrical post tests, seal, visual and mechanical examination.
M39016/44-XXX	2 units of each remaining coil voltages, qualification inspection table, group II. 1 open unit, any coil voltage.

CONCLUDING MATERIAL

Custodians:
(D) Army - ER
Navy - EC
(D) Air Force - 85

Review activities:
Navy - AS, OS, SH

(D) User activity:
Air Force - 11

Preparing activity:
Navy - EC

Agent:
DLA - ES

(Project 5945-0757-37)